



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,512	12/31/2003	Sarkis Barkhoudarian	U73.12-0064	9235

164 7590 12/11/2006

KINNEY & LANGE, P.A.
THE KINNEY & LANGE BUILDING
312 SOUTH THIRD STREET
MINNEAPOLIS, MN 55415-1002

EXAMINER

BHAT, ADITYA S

ART UNIT	PAPER NUMBER
----------	--------------

2863

DATE MAILED: 12/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/750,512

Applicant(s)

BARKHOUDARIAN, SARKIS

Examiner

Aditya S. Bhat

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 14-18 and 20-66 is/are rejected.
- 7) ☒ Claim(s) 10-13, 19, 32, 43-46, 52 and 65 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

With regards to claims 34-66 the methods recited in the claimed invention do not produce a real life, real world, useful, concrete, and tangible **result**.

The claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible **result**." State Street, 149 F.3d at 1373, 47 USPQ2d at 1601-02. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research (Brenner v. Manson, 383 U.S. 519, 528-36, 148 USPQ 689, 693-96); In re Ziegler, 992, F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993)).

A process that consists solely of the manipulation of an abstract idea is not concrete or tangible. See In re Warmerdam, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). See also Schrader, 22 F.3d at 295, 30 USPQ2d at 1459. Nor can one patent "a novel and useful mathematical formula," Flook, 437 U.S. at 585, 198 USPQ at 195; electromagnetism or steam power, O'Reilly v. Morse, 56 U.S. (15 How.) 62, 113-114 (1853);

In this instance the result is merely a manipulation of data. The measurement data must be capable of being conveyed to the user or must be stored for later retrieval.

Please view the following guidelines to overcome 35 U.S.C. 101 rejection made in this office action in MPEP 2106 and/or

<http://www.uspto.gov/web/offices/com/sol/oq/2005/week47/patgupa.htm>

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-2, 4-9, 14-18, 20-28, 30-35, 37-61 and 63-66 are rejected under 35 U.S.C. 102(a) as being anticipated by Cusumano et al. (USPN 6,567,752).

With regards to claim 1, Cusumano et al. (USPN 6,567,752) teaches a system for monitoring rotating machinery having a shaft and circumferentially disposed extensions rotatable with said shaft and spaced apart from one another, the system comprising:

a plurality of proximeters positioned proximate to said rotating machinery and each proximeter being operable to measure (Col.12, lines 59-60) and transmit resonant vibration frequency and amplitude data derived from a transit time between said individual rotating extensions, along with signal amplitude data; (Col.12, lines 57-62) and

a processor electrically coupled to receive said data and configured to correlate said data and thereby produce an assessment of operational health for said

Art Unit: 2863

machinery. (Col. 14, lines 5-10)

With regards to claim 2, and 35 Cusumano et al. (USPN 6,567,752) teaches a processor assessment includes a remaining operational life prediction for said machinery. (Col.13, lines 35-38)

With regards to claim 4 and 37, Cusumano et al. (USPN 6,567,752) teaches a resonant vibration data includes radial runout data for said shaft. (Col. 4, lines 35-42)

With regards to claim 5, 38 and 41 Cusumano et al. (USPN 6,567,752) teaches a gearbox comprising a gear having multiple teeth, and said radial runout data indicates radial positions of said teeth. (Col. 3, lines 25-30)

With regards to claim 6, and 39 Cusumano et al. (USPN 6,567,752) teaches a rotating shaft, and said processor correlates said resonant vibration data and radial runout data for said shaft. (Col.4, lines 31-42)

With regards to claim 7, Cusumano et al. (USPN 6,567,752) teaches proximeters further measure and transmit axial movement data for said shaft. (Col.12, lines 58-65)

With regards to claim 8, Cusumano et al. (USPN 6,567,752) teaches rotating machinery comprises a gearbox comprising a gear having multiple teeth, and said proximeters further measure and transmit axial movement data. (Col. 3, lines 22-31)

With regards to claim 9, and 40 Cusumano et al. (USPN 6,567,752) teaches processor correlates said resonant vibration data and axial movement data for said shaft. (Col.4, lines 31-42)

which one of said electromagnetic proximeter is disposed. (Refer to figure 2)

With regards to claim 14, and 47 Cusumano et al. (USPN 6,567,752) teaches multiple rotating machinery components having a shaft and circumferentially disposed extensions rotatable with said shaft and spaced apart from one another; and additional proximeters, positioned circumferentially apart from one another and proximate to different respective components, and operable to measure and transmit non-duplicative resonant vibration and amplitude data for each of said rotating extensions along with signal amplitude data for said multiple rotating machinery components. (Refer to figure 2).

With regards to claim 15, and 48 Cusumano et al. (USPN 6,567,752) teaches rotating machinery comprises a gearbox comprising a gear having multiple teeth. (Col.3, lines 25-30)

With regards to claim 16, and 49 Cusumano et al. (USPN 6,567,752) teaches a processor assesses the operational health of each of said teeth. (Col. 3, lines 44-49)

With regards to claim 17, and 50 Cusumano et al. (USPN 6,567,752) teaches at least two gears that mesh at a meshing point, and at least one of said proximeters is disposed at a location approximately 180° from said meshing point. (Col.3, lines 25-30)

With regards to claim 18, and 51 Cusumano et al. (USPN 6,567,752) teaches a housing having an interior space in which said rotating machinery is disposed, and a wall defining at least a portion of said interior space and separating said proximeters from said rotating machinery. (Refer to figure 2)

With regards to claim 20, and 53 Cusumano et al. (USPN 6,567,752) teaches at least one of said proximeters is exposed to said rotating machinery. (Refer to figure 2)

Art Unit: 2863

With regards to claim 21, and 54 Cusumano et al. (USPN 6,567,752) teaches the processor compares said measurements with predetermined values to assess said rotating machinery operational health. (Col. 3, lines 49-49)

With regards to claim 22, and 55 Cusumano et al. (USPN 6,567,752) teaches predetermined values include previously accumulated resonance data, including established maximum values for acceptable machinery fatigue levels. (Col.13, lines 39-43)

With regards to claim 23-24, and 56-57 Cusumano et al. (USPN 6,567,752) teaches resonance data comprises vibration data. (Col.12, lines 61-63)

With regards to claim 25, and 58 Cusumano et al. (USPN 6,567,752) teaches a predetermined values further comprise values for a radial gap between a gear tooth and a housing in which said gear tooth is housed. (Col.3, lines 27-30)

With regards to claim 26, and 59 Cusumano et al. (USPN 6,567,752) teaches an alerting signal generator that produces a signal reporting said rotating machinery operational health. (Col.3, lines 33-35)

With regards to claim 27, and 60 Cusumano et al. (USPN 6,567,752) teaches alerting signal comprises instructions for maintaining said rotating machinery. (Col. 14, lines 5-8)

With regards to claim 28, and 61 Cusumano et al. (USPN 6,567,752) teaches alerting signal comprises a textual, audio, or video signal. (Refer to figure 3-4) (must have means to display graph)

Art Unit: 2863

With regards to claim 30, and 63 Cusumano et al. (USPN 6,567,752) teaches processor is configured to detect rotating machinery chatter. (Col. 12, lines 61-62)

With regards to claim 31, and 64 Cusumano et al. (USPN 6,567,752) teaches processor is configured to detect a frequency and amplitude of said machinery chatter. (Col. 12, lines 61-62)

With regards to claim 32, and 65 Cusumano et al. (USPN 6,567,752) teaches processor is configured to assess lubricity degradation for said rotating machinery based on said machinery chatter. (Col. 13, lines 35-38)

With regards to claim 33, and 66 Cusumano et al. (USPN 6,567,752) teaches rotating machinery comprises a gearbox comprising a gear having multiple teeth, and said proximeters are spaced at odd harmonics of the resonance frequency quarter wavelength of said teeth. (Col.3, lines 27-30)

With regards to claim 34, Cusumano et al. (USPN 6,567,752) teaches a method for monitoring rotating machinery having a shaft and circumferentially disposed extensions rotatable with said shaft and spaced apart from one another, the method comprising the steps of:

positioning a plurality of proximeters proximate to said rotating machinery, said proximeters being operable to measure and transmit resonant vibration and amplitude data derived from a transit time between said individual rotating extensions, along with signal amplitude data; (Col.12, lines 57-62)

receiving and correlating said data using a processor that is electrically coupled to said plurality of proximeters; (Col.14, lines 5-10) and

producing an measurement of operational health for said machinery based on said measurements using said processor.(Col.13, lines 35-38)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 29, 36 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cusumano et al. (USPN 6,567,752) in view of Discoenzo (USPN 6,847,854)

With regards to claim 3 and 36, Cusumano et al. (USPN 6,567,752) does not explicitly disclose a processor assessment includes a maintenance schedule for said machinery. Discoenzo (USPN 6,847,854) discloses a processor assessment includes a maintenance schedule for said machinery (Col.25, lines 23-25)

With regards to claim 29, and 62 Cusumano et al. (USPN 6,567,752) does not explicitly disclose alerting signal automatically halts action of said rotating machinery. Discoenzo (USPN 6,847,854) discloses alerting signal automatically halts action of said rotating machinery. (Col.31, lines 17-25)

It would have been obvious to one skilled in the art at the time of the invention to modify the Cusumano et al. (USPN 6,567,752) invention to include the above noted limitations in order to minimize waste, scrap and insure a reliable safe process that will not fail unexpectedly. (Col. 1,lines 44-45)

Response to Arguments

Applicant's arguments filed 9/20/2005 have been fully considered but they are not persuasive.

Applicant is reminded that during patent examination, the pending claims must be "given the broadest reasonable interpretation consistent with the specification." Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

While the meaning of claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allowed. This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

In this instance applicant argues that the prior art of record does not teach a test system for rotational machinery, (col. 3, lines 28-30) a plurality of proximeters working together, (col.12, lines 59-63) the prior art of record does not teach two distinct types of data required by the independent claims (col.12, lines 62-63), runout data (col. 7, lines 43-45), any data relating to axial movement (col. 3, lines 28-30),

Regarding applicants argument that the Cusumano reference does not teach amplitude data, the Cusumano reference teaches obtaining frequency data of a signal over time. Since a signal with a frequency is taught by the prior art, it would be inherent for it to also have an amplitude. It should also be noted that the reference also collects raw data (col. 12, lines 62-67), which would include any data pertinent to the operation of the machinery. For the foregoing reasons the rejection is deemed proper.

With regards to applicants argument that states the amplitude as it relates to resonance data, is not the same as signal amplitude data. Examiner fails to see the distinction. Examiner requests clarification on this matter since the claim language is not clear how the amplitudes differ.

With regards to the plurality of proximeters the Cusumano et al reference teaches a variety as well as a plurality of sensors. (Col.12, lines 59-63) It should be noted that the claim does not recite that the sensors are "working together".

Applicant's arguments with regards to claims 10-13, 19,32 43-46, 52 and 65 have been found persuasive therefore the rejections have been withdrawn.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 10-13, 19, 32, 43-46, 52 and 65:

Claims 10-13, 19,32, 43-46, 52 and 65 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2863

The primary reason for the allowance of claims 10-13, 19, 43-46, and 52 is the inclusion of: electromagnetic, capacitive and optical proximeters. It is this/these features found in the claim(s), as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this/these claim(s) allowable over the prior art.

The primary reason for the allowance of claims 32 and 65 is the inclusion of: an assessment of lubricity degradation based upon machinery chatter. It is this/these features found in the claim(s), as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this/these claim(s) allowable over the prior art.

Claims 2-8 are allowed due to their dependency on claim 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wegerich et al. (USPN 6,859,739) teaches a global state change indicator for empirical modeling in condition based monitoring.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aditya S. Bhat whose telephone number is 571-272-2270. The examiner can normally be reached on M-F 9-5:30.

Art Unit: 2863

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aditya Bhat
November 20, 2006

BRYAN BUI
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read 'Bryan Bui', is written below the printed name and title.